

I CLAIM:

1. A process for depositing a dielectric material on a surface, comprising
providing a chemical vapor deposition chamber having disposed therein a substrate;
introducing a gas comprised of a linear fluoroalkane having four or more carbon atoms to said chamber
introducing a suitable dopant source gas for providing the dielectric material with thermomechanical stability; and
depositing a doped fluorinated carbon film onto said substrate.
2. A process as claimed in Claim 1, wherein said doped fluorinated carbon film has a dielectric constant of about 2.5 or less.
3. A process as claimed in Claim 1, wherein said doped fluorinated carbon film has a dielectric constant of about 2.2 or less.
4. A process as claimed in Claim 1, wherein said linear fluoroalkane contains about 5 to about 9 carbon atoms.
5. A process as claimed in Claim 1, wherein said depositing is performed under plasma-enhanced chemical vapor deposition conditions.
6. A process as claimed in Claim 1, wherein said depositing is performed at a temperature of about 400°C or less in the presence of an *in-situ* plasma.
7. A process as claimed in Claim 1, wherein said depositing is performed under thermal chemical vapor deposition conditions by heating said substrate to a temperature in the range of about 300°C to about 500°C.
8. A process as claimed in Claim 1, wherein said dopant source gas further comprises a dopant selected from the group consisting of methyl silane, ethyl silane, dimethyl silane, diethylsilane, methyl germane, ethyl germane, dimethyl germane, diethylgermane, disilylmethane, silane, disilane, trisilane, germane, digermane, and mixtures thereof.
9. A process as claimed in Claim 1, wherein said gas further comprises an alkane having from 1 to 9 carbons.

10. A process as claimed in Claim 1, wherein said dopant source gas comprises methyl silane or methyl germane.

11. A process as claimed in Claim 1, wherein said doped fluorinated carbon film comprises $-(CF_2)_n$ - units linked to dopant molecules.

12. An integrated circuit comprised of a substrate having a doped fluorinated carbon film deposited thereon, wherein said doped fluorinated carbon film is comprised of $-(CF_2)_n$ - groups linked to dopant molecules.

13. An integrated circuit as claimed in Claim 12, wherein said doped fluorinated carbon film comprises Si, Ge or CH_3 dopants.

14. A computer system comprised of an integrated circuit, wherein said integrated circuit is comprised of a substrate having a doped fluorinated carbon film deposited thereon, and wherein said doped fluorinated carbon film comprises $-(CF_2)_n$ -units linked to dopant molecules.

15. A process for depositing a dielectric material on a surface, comprising
providing a chemical vapor deposition chamber having disposed therein a substrate;

introducing a gas comprised of a linear fluoroalkane having four or more carbon atoms and a dopant source to said chamber;

creating a plasma within said chamber; and

depositing a doped fluorinated carbon film onto said substrate,

wherein said doped fluorinated carbon film has a dielectric constant of about 2.5 or less.

16. A chemical vapor deposition apparatus, comprising
a chemical vapor deposition chamber having disposed therein a substrate;
a vessel containing a linear fluoroalkane having four or more carbon atoms,
at least one vessel containing a dopant source for imparting thermomechanical stability to fluorinated carbon films;

feed lines connecting said vessels to said chemical vapor deposition chamber;

and

a manifold operatively connected to said feed line to control the passage of said linear fluoroalkane to said chemical vapor deposition chamber.